

# E-Waste Recycling and the Universal Waste Regulations



**Hazardous Materials and  
Waste Management Division**

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# Presentation

- Hazardous waste vs universal waste
- Who is regulated? Handler classifications
- Handler requirements
- Common violations



# Hazardous Waste

- Hazardous waste defined under 6 CCR 1007-3, Part 261
  - 1. *Characteristic*** – a.) ignitibility, b.) corrosivity, c.) reactivity, or d.) ***toxicity***
    - Wastes must meet criteria – physical properties
  - 2. *Listed*** –specific and non-specific sources, discarded commercial chemical products
    - Wastes are listed in regulations

# Toxicity Characteristic

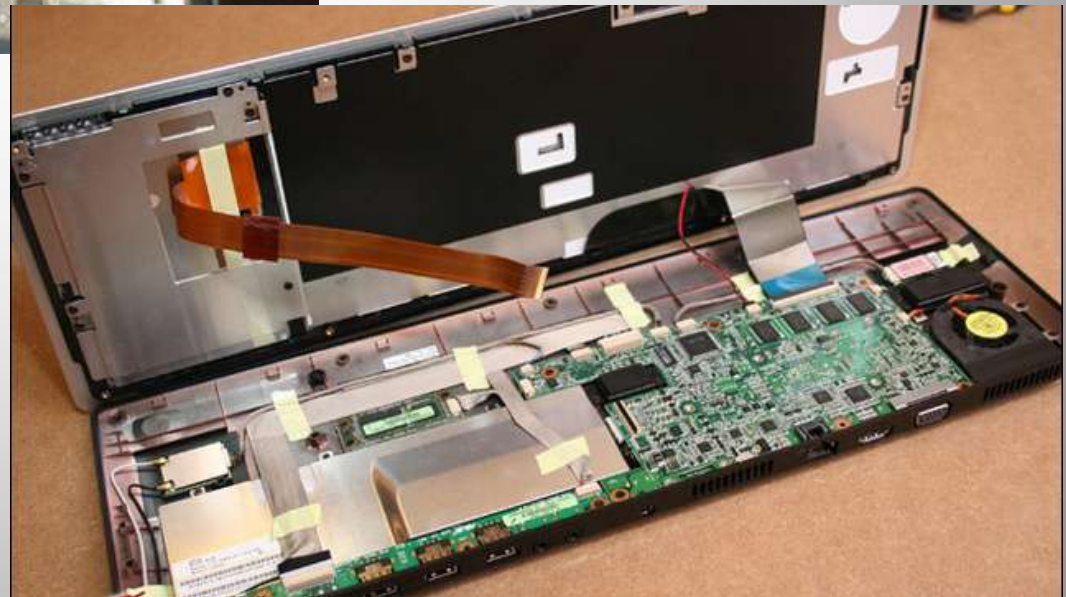
- 39 contaminants listed by concentration
- 8 metals on the list – arsenic, barium, selenium, cadmium, chromium, lead, mercury, silver
- In electronics, lead, mercury, cadmium, and chromium are the drivers
- Using the “TCLP” laboratory test - Toxicity Characteristic Leaching Procedure

# TCLP and Electronics

- TCLP simulates conditions in MSW landfill, contaminants leach into groundwater
- Requires sized-reduced sample to pass a 0.95-cm sieve
- Computer/component must be ground, shred to appropriate particle size
- Problems – no lab equipment, very heterogeneous devices, human bias
- Many models, many manufacturers

# TCLP and Electronics

- 2004 University of Florida study
  - Looked at different methodologies
  - 6/6 laptops, 28/28 cell phones, 15/15 mice, 9/9 CRTs were hazardous waste
  - 1/11 CPUs, 0/3 keyboards were hazardous waste
- Numerous CRT studies; CA DTSC study
- Impossible to have TCLP on every make and model



# Solution

- You can use generator knowledge of a waste, you don't have to run TCLP on every piece.
- Generators and handlers make assumption that most electronics are hazardous
  - Cheaper, easier, more efficient, faster
  - Doesn't change where the material goes
  - Doesn't add a great regulatory burden

# Universal vs Hazardous Waste

- Universal waste is hazardous waste!
  - Must be characteristic or meet a listing description for hazardous waste
- Electronic waste that isn't characteristic or listed is a solid waste.



# Waste vs Product

- Must be a waste to be regulated by hazardous/universal waste regulations
- Electronics that will be refurbished, resold, or reused are still a product
- Many commodities generated from electronics disassembly become products: scrap metal, plastic, circuit boards



# Waste Determination at the Generator

- If downstream E-waste recycler will review and select material for resale, the electronics are not regulated as universal waste.
- If downstream E-waste recycler recycles all material, the electronics are regulated as universal waste.

Is this regulated  
universal waste?



CDPHE

# Sham Product Argument

- Stored in lieu of disposal
- Is it being managed as a product? That has value?



# Household Exemption

- Household hazardous waste is exempt from hazardous waste regulations. Part 261.4(b)
- Commingled waste – household and non-household – is regulated waste.



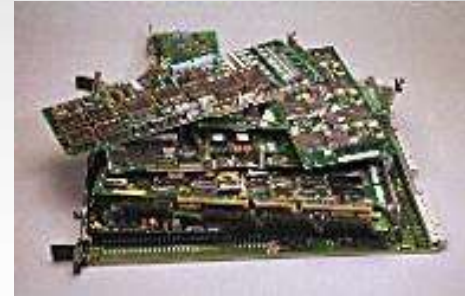
# “Electronic Devices” and “Components”

- Devices that contain circuit boards or other parts that exhibit toxicity characteristics for heavy metals like lead, chromium, mercury, cadmium or silver
  - CPUs
  - CRT monitors
  - Laptops
  - Computer peripherals
  - Cell phones
  - TVs



# Intact computers are regulated; separated components may be exempt if recycled

Universal  
waste  
electronics



Circuit boards -  
exempt



Wire - exempt  
scrap metal



Casings - exempt scrap metal  
and plastic



Glass cullet – excluded if used  
as product substitute



Monitor glass, intact hard drive or  
power supply, etc. – universal  
waste

# Universal Waste Regulations

- Provides less stringent standards for handlers and transporters of six widely generated waste streams. Part 273
  - Discourage illegal disposal
  - Encourage recycling
  - Reduce regulatory burden
- Universal wastes:  
Pesticides, mercury-containing lamps, batteries, aerosol cans, mercury containing devices, computers & electronic devices

# Universal Waste (UW) Regulations


- Universal waste is still hazardous waste – meet all UW requirements or are subject to full RCRA regulation.
  - “If a waste handler chooses to manage its universal waste under the Part 273 regulations, but fails to meet those requirements, the waste handler remains subject to, and must comply with, all applicable requirements of the Colorado Hazardous Waste Regulations.”

# Universal Waste Handlers

- Those that manage Universal Wastes are called “handlers”
  - Generators and consolidation facilities
- **Small quantity handler**  
<5,000 kg universal wastes onsite at one time
- **Large quantity handler**  
≥5,000 kg universal waste onsite at one time

# Requirements for Handlers

- Same for both handler classifications except Large Quantity Handlers must also:
  - Notify and obtain EPA ID #, even if already have a number for other reasons
  - Keep records of waste shipped to/from facility

<b>MAIL FORM TO:</b> CDPHE HMWMD-B2 4300 Cherry Creek Dr. S. Denver, CO 80246-1530	<b>COLORADO HAZARDOUS WASTE NOTIFICATION FORM</b> Replaces EPA Form 8700-12, 8700-13A/B, and Page 1 of 8700-23	 Colorado Department of Public Health and Environment
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# Requirements for All Handlers

- Manage material in a way that prevents release to the environment
- Accumulation time - one year
- Immediately contain all releases and residues from universal wastes.









# Containers

- Must contain devices, or components in containers
- Structurally sound, adequate to prevent breakage, and compatible
- No leakage or spillage
- Immediately clean up broken components, containerize
- Do not have to be closed

# Containers



# Containers



# Apply to All Handlers

## Labels

- “Used - *material type*,”
- “Waste - *material type*,” or
- “Universal Waste - *material type*”
- Label individual wastes or accumulation container

# Labels

**UNIVERSAL  
WASTE**

Location Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: Denver \_\_\_\_\_  
State: CO \_\_\_\_\_  
Zip Code: 80221 \_\_\_\_\_  
Date: \_\_\_\_\_  
Additional Comments: \_\_\_\_\_

**Power Supplies**  
(fans)  
Date: \_\_\_\_\_  
WT: \_\_\_\_\_

**SALVAGE**  
BAD. T.V.'S  
STORE: \_\_\_\_\_

Lot Label  
Date 12-15-10  
Control Ticket (If Applicable) \_\_\_\_\_  
Contents \_\_\_\_\_  
Gross Weight: 271 X 6 BULBS  
Tare Weight: \_\_\_\_\_  
Net Weight: \_\_\_\_\_  
**USED ELECTRONICS  
FOR RECYCLING**  
State of CA: UNIVERSAL WASTE  
ELECTRONIC DEVICES

**Universal Waste**  
Load date 11/18/10  
Aluminum-Clean  
Gross: \_\_\_\_\_ Lbs.  
- 64 lbs. for  
pallet/gaylord weight  
Net: \_\_\_\_\_ Lbs.

# Apply to all Handlers

## Limited treatment allowed

- Disassembly of electronic devices
  - Shredding hard drives
  - Tower & CRT disassembly



# Treatment Requirements

- Develop a written procedure, train staff to follow it
  - Operation and maintenance
  - Precautions to protect workers
  - Waste management and disposal
- Transfer waste to a proper container
- Prevent releases, maintain appropriate spill kit and know how/when to use

# Training

- All employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal facility operations and emergencies.
- Suggest documentation

# Apply to All Handlers

- Must ship to another universal waste handler or to destination facility
- Destination facility = treatment, disposal or recycling facility
  - Subject to hazardous waste permitting requirements
    - Treatment beyond that allowed for handlers
    - Disposes of waste in hazardous waste landfill
  - Subject to SW recycling regulations
- Receiving handler must agree to receive shipment prior to shipping

# Universal Waste Transporters

- Regulations cover anyone who transports regulated universal waste



# Universal Waste Transporters

- If you self-transport, you become a Universal Waste Transporter and subject to Subpart D
  - No UW disposal
  - No diluting or treatment
  - Must comply with DOT transport regulations 49 CFR 171-180
  - Storage for only 10 days or less
  - Immediate response to releases
  - Transport only to a handler, a destination facility, or foreign destination

# Universal Waste Exports

## If ship to OECD countries – Part 262, Subpart H

- Destined for recovery operations authorized to operate in importing country
- Compliance with applicable international transport agreements
- Notification and consent – “OECD Export Notification”
- Tracking document
- Contracts
- Provisions relating to recognized traders
- Reporting and recordkeeping – annual reports

# Universal Waste Exports

## OECD countries:

- Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States
- For the purposes of this subpart, Canada and Mexico too!

# Universal Waste Exports

## If ship to non-OECD countries


- Notification of intent to export to EPA
- Annual report to EPA
- Recordkeeping – copies of each Notification of intent, EPA Acknowledgment of Consent, each confirmation of delivery, and each annual report for 3 years
- Export only upon consent of receiving country and in conformance with EPA Acknowledgment of Consent
- Provide EPA Acknowledgment of Consent to transporter

# Basel Convention - 1989

- Reduce movement of hazardous waste between nations, from developed to less developed.
- Of 175 parties only Afghanistan, Haiti, and United States have not ratified.
- Conditions on import and export, requirements for notice, consent, tracking.
- 1995 - Basel Ban Amendment - Prohibits export of hazardous waste from a list of developed (mostly OECD) countries to developing countries.

# Large Quantity Handlers

- Notify Department and obtain an EPA ID #
- No fee with notifying
- One time

<b>MAIL FORM TO:</b> CDPHE FBMWMD-B2 4300 Cherry Creek Dr. S. Denver, CO 80246-1530		<b>COLORADO HAZARDOUS WASTE NOTIFICATION FORM</b> <small>Replaces EPA Form 8700-12, 8700-13A/B, and Page 1 of 8700-23</small>		 Colorado Department of Public Health and Environment
<b>1. Reason for Submittal: (Mark 'X' in the appropriate boxes)</b> <input type="checkbox"/> Initial notification and obtain an EPA ID Number for hazardous waste, universal waste, or used oil activities. <input type="checkbox"/> Subsequent notification to update information (Sec. 2-6 and 10 must be completed). <input type="checkbox"/> Initial RCRA Hazardous Waste Part A Permit Application (Page 3-7 of 8700-23 must also be submitted). <input type="checkbox"/> Component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment # _____). <input type="checkbox"/> Component of a biennial Hazardous Waste Report and a subsequent notification.				
<b>2. Site EPA ID Number:</b>				
<b>3. Site Legal Name/Operator:</b>				
<b>4. Site Location Information:</b>				<b>County Name:</b>
<b>Street Address:</b>				
<b>City or Town:</b>			<b>State:</b> CO	<b>Zip Code:</b>
<b>5. Site Land Type:</b> <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Indian <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other				
<b>6. North American Industry Classification System (NAICS) Code(s) for the Site:</b>		<b>A.</b>	<b>B.</b>	<b>C.</b>
<b>7. Site Mailing Address</b> Same as <input type="checkbox"/> Location <input type="checkbox"/> Mailing <b>Street Address:</b>				
<b>City or Town:</b>		<b>State:</b>	<b>Zip Code:</b>	
<b>8. Site Contact Person</b>	<b>First Name:</b>	<b>MI:</b>	<b>Last Name:</b>	
<b>Job Title:</b>		<b>Phone Number:</b>	<b>Extension:</b>	
<b>Address same as</b> <input type="checkbox"/> Location <input type="checkbox"/> Mailing <b>Street Address:</b>				
<b>City or Town:</b>			<b>State:</b>	<b>Zip Code:</b>
<b>9. Name of Site's Owner:</b>				<b>Phone Number:</b>
<b>Address same as</b> <input type="checkbox"/> Location <input type="checkbox"/> Mailing <input type="checkbox"/> Contact <b>Owners Street Address:</b>				
<b>City or Town:</b>			<b>State:</b>	<b>Zip Code:</b>
<b>Owner Type:</b> <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Indian <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other				
<b>10. Type of Regulated Waste Activity (Mark 'X' in the appropriate boxes for all activities in Sections 10A, 10B, and 10C).</b>				
<b>A. Hazardous Waste Activities</b> For Items 2 through 7, check all that apply.				
<b>1. Generator of Hazardous Waste</b> (choose only one) <input type="checkbox"/> a. LQG: Greater than 1,000 kg/mo (2,200 lbs.) of non-acute hazardous waste; or <input type="checkbox"/> b. SQG: 100 to 1,000 kg/mo (220 - 2,200 lbs.) of non-acute hazardous waste; or <input type="checkbox"/> c. CESQG: Less than 100 kg/mo of non-acute hazardous waste <b>Indicate other activities (check all that apply)</b> <input type="checkbox"/> d. United States Importer of Hazardous Waste <input type="checkbox"/> e. Mixed Waste (hazardous and radioactive) Generator <input type="checkbox"/> 2. Transporter of Hazardous Waste				
<input type="checkbox"/> 3. Hazardous Waste Transfer Facility <input type="checkbox"/> 4. Treater, Storer, or Disposer of Hazardous Waste Note: A hazardous waste permit is required for this activity. <input type="checkbox"/> 5. Recycler of Hazardous Waste Note: A hazardous waste permit may be required for this activity. <input type="checkbox"/> 6. Exempt Boiler and/or Industrial Furnace <input type="checkbox"/> a. Small Quantity On-site Burner Exemption <input type="checkbox"/> b. Smelting, Melting, Refining Furnace Exemption <input type="checkbox"/> 7. Underground Injection Control				

# Large Quantity Handlers

## Tracking

- Keep record of each shipment of UW received at the facility and sent to other facilities
  - Log, invoice, manifest, bill of lading, or other shipping document
  - Name, address, quantity of each waste, date
- Keep records for three years from shipment date

# Prohibitions on Handlers

- Universal wastes are hazardous wastes!
  - No onsite disposal, no disposal to regular trash
  - No treatment except as provided in the universal waste rules



# Benefits Over HW Regulations

- Less stringent requirements
- Not required to count UW toward monthly HW generator total
- Not required to use hazardous waste manifest
- Not required to use hazardous waste transporter



# Solid waste vs hazardous waste

Applies to all recyclable materials	Applies to hazardous waste
Registration – all facilities	Notification (EPA ID Number) – LQHS only
3 year rolling average turnover rate	1 year accumulation
Annual Report	No reporting requirement
Prevent groundwater contamination/odor	Prevent releases to environment
Operations Plan	Written disassembly procedures
No container management requirements	Container management requirements
No training	Training
No disassembly requirements	Disassembly requirements
No spill requirements	Spill requirements
Solid waste disposal	No solid waste disposal
No shipment tracking	Track all shipments - LQHS
No export requirements	Export requirements

# Colorado vs EPA

- Colorado incorporates electronic waste in our universal waste regulations.
- EPA does not – electronic waste is regulated under hazardous waste requirements.
- EPA has streamlined rule for CRTs – to facilitate recycling. CO hasn't adopted.